



**Sandia  
National  
Laboratories**

# AUTONOMOUS COMBUSTION-POWERED HOPPING ROBOT



## TECHNOLOGY READINESS LEVEL: 6-7

PROTOTYPES HAVE BEEN DEMONSTRATED IN RELEVANT, OPERATIONAL ENVIRONMENTS.

## TECHNOLOGY SUMMARY

Sandia's hopping robotic platform provides a groundbreaking, energy efficient capability. Hopping mobility has been shown to be five times more efficient than hovering when traversing obstacles at heights under 10 meters.

Two versions of the robots exist. One being about the size of a grapefruit and capable of approximately 4,000 hops on a single tank of fuel (less than an ounce) of about 3 feet high and 6 feet from the starting point of the jump- pictured below. The other is about the size of a shoe box and able to overcome as many as 30 obstacles that are over 20 feet high with about 100 hops per tank of fuel.

**US PATENTS # 6,247,546  
7,775,305  
6,286,386  
6,308,791  
6,328,002**



The four-wheeled version of the robot overcomes traditional barriers associated with long-range missions and terrain including management of shock forces, hop height, and efficiency. Furthermore, the robots are equipped with compasses or GPS that allows them to orient themselves once landed.

## POTENTIAL APPLICATIONS

- Search & Rescue Missions
- Space Exploration
- Law Enforcement & First Responders
- Environmental Assessment

## TECHNOLOGICAL BENEFITS

- Energy efficient combustion technology
- Can overcome a variety of obstacles & environments
- Self-orienting
- Long-range travel
- Situational awareness
- Autonomous mobility
- Lightweight & reduced size

## TECHNOLOGY INQUIRY?

For more information or  
licensing opportunities contact  
us at

**[ip@sandia.gov](mailto:ip@sandia.gov)**

Refer to SD # 6339

or visit

**<https://ip.sandia.gov>**